

## HOW TROUT WERE INTRODUCED INTO KASHMIR

BY

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Readers of the *Journal* may have seen Col. Godfrey's account of 'How British Trout came to Kashmir' in the *Fishing Gazette* of 13th July last. After 30 years, individual memories are rarely complete and I regret he has omitted any mention of my brother Willie and of my old friend Capt. Allan, both alas! now passed away, whose subscriptions and efforts to raise a fund for the purpose in the summer of 1899 preceded the meeting he refers to.

Col. Ward was at that time my brother's partner in a roadmaking contract and Col. Unwin, a close personal friend, and both had promised their subscriptions before Col. (then Major) Godfrey came into the picture. I quite appreciate that without the support of the Residency and the Duke of Bedford's very generous gifts and subscriptions, it might have been impossible to carry through the scheme efficiently, as, though Col. Ward's influence with the Maharajah was most useful, he himself was not a great believer in success, owing to the failure of similar attempts in other parts of India, of which he knew. Beyond subscribing he took little interest in the work of the early years after the importations of ova, presented by the Duke of Bedford in 1900 and 1902, but, I am glad to say, enjoyed some excellent fishing in the Dachigam Rukh after 1906.

To explain how I came into the matter I would mention that, after 17 years spent in India, including a few months in Ceylon, where my brother-in-law was one of those who first brought brown trout into the Island, I had returned from the East and spent nine years in Great Britain, where in much of my leisure throughout this period I enjoyed the company of experts of the rod on the lochs and streams of Scotland.

When I left India in 1890, it was possible to dine in the Yacht Club at Bombay in flannels after a sail, and on a farewell visit to my brothers in Kashmir in the Spring of that year, I found that it was possible to dine at the Residency there, on occasion, in pautoos, garments made of rough local cloth of which I am still fond. I had to ride from Chekoti, where the driving road then ended, along a hill track to Uri and thence, on the new road to Baramoola. From there to Srinagar I travelled in a Doonga—a thatched boat in which my sleeping room was separated from the kitchen and servants' quarters by a wooden partition. I think only three house-boats, built by Sir Henry Lennard, Mr. Martin Kenard and Mr. Spedding were then in existence.

When I returned in May 1899, all was changed and dress was 'de rigueur' everywhere. The roads into the country—constructed chiefly by my brothers—had been completed, and I was able to drive all the way to Gupkar ( $1\frac{1}{2}$  miles beyond the Residency) where my brother Willie had a house. The river and lakes were full of house-boats with parties of ladies and young men on leave, and gaieties were in full swing. To a man of 44 who has lost his money and has a family at home to support, the attractions of society are not great and I settled down to work at once. It was not very long however before I discovered, ten miles away, above the Srinagar water works, a lovely valley in which hill barbel swarmed in a stream flowing through beautiful woods and mountains. From this valley, then an open one, but closed as a game preserve in 1902, the craggy sides of Mahadeo (Great God) rose to 13,500 feet above sea level. Many a happy week end was spent there during and after the summer of 1899. My description of it as 'an angler's paradise, could trout be substituted for barbel', a transformation I believed quite possible, had probably something to do with my brother's action in enlisting subscribers and it was a great joy to me when I met Major Godfrey for the first time and heard of the Duke of Bedford's generous offer to send out ova if someone could be found to look after it. Very willingly I undertook the charge. Possibly, if the first letter thereafter to the Duke had contained more full instructions for shipment, a mistake might have been avoided, and had the first ova arrived safely when Capt. Allen went down to meet it in the spring of 1900, the whole history of trout in Northern India might have been altered.

As it was, the failure was looked upon by the State officials as the end of the business and practically all Major Godfrey's arrangements were cancelled. The Dilawar Khan Bagh, which had been placed at my disposal for hatchery purposes, was handed over to the Educational Department for a school, for which it was excellently suited. The Arrah River in the Datchigam Valley was no longer allowed to be a prospective club water, nor was any part of the Dal Lake to be netted off, or reserved in any way for trout. When I heard from Major Godfrey that ova was to come, I had to make my own arrangements and it was with considerable difficulty that I got the Srinagar Municipality to give me a connecting  $\frac{1}{2}$ " pipe from our carpet factory water-supply to the verandah of my dwelling house where I arranged the ova should be hatched out. The hatching box was placed within a foot of my bed-head, a thin wooden partition only intervening, and this proximity really saved the situation. Several times I was awakened by the stoppage of the flow of water and my men were promptly roused and despatched to bring cans of water, while an urgent messenger raced off to the municipal authorities. When the alevin stage was passed, a rearing pond was dug in the factory compound and the pipe connection was transferred there, but municipal failings still continued, though at longer intervals, and were less quickly detected. I well remember taking a plate with half a dozen little beauties of 3" to 5" which had perished during one of these lapses, to the Resident, to whom I poured out my indignation. Col. Deane (afterwards

Sir Harold, Chief Commissioner of the N. W. F. P.) was not a man to pass over that sort of thing and it didn't occur again. He really became interested in the work and, though he considered the State should not alienate their water, he suggested I should begin operations by stocking the Arrah River, in what was to be the Datchigam Rukh area. To this I objected on the ground that neither I nor my friends, who had joined in raising money, would be allowed to fish there, but on receiving a demi-official letter from him stating that we should always have that privilege, I gave way. A stew pond was established in the Rukh area and the Arrah was the first river stocked.

When we first heard that ova was to arrive by the 'Caledonia', funds were not over-plentiful and, with no club water, there was no prospect of obtaining more money from private subscribers. The Resident had given it as his opinion that the State should find funds at least equal to what had been subscribed by the club, but no response had been made to this. The Durbar no longer believed in the success of the scheme, and Colonel Deane's tenure at the Residency was to be a short one. The greatest economy was required. Someone had to go down to meet and bring up the ova, with an extra packing case in which it might be safely brought through the heat of Bombay, and a man must be found to attend to the ova while hatching and to have the care of the young trout up to the time they could reproduce their own species, three years at least, if no further hatchery arrangements were to be considered. Young James Sidgreaves Macdonell of Mora, who was with us at the time, undertook the first task and carried it through most successfully, arriving at the carpet factory late one evening in the Christmas week of 1900.

(I should here note my thanks to the late Capt. Kitchen of the 5th Gurkhas for a diary account he sent me of an unsuccessful attempt he had made to establish trout in a stream near Abbottabad under most difficult conditions in spite of which he almost reached success. The protective box in which the Laird brought up the ova was similar to the one Kitchen had used successfully.)

What an evening that was! We had gone through the misery of a fisherman's 'Paradise Lost' in spring and now we had before us the prospect of 'Paradise Regained'! After the Laird, as we called him, had his bath and some food, we started right away and spent most of the night transferring the ova from the moss packing in which it arrived to the glass grills of the hatching box sent out by the Duke, over which we soon had the water running from the  $\frac{1}{2}$ " pipe. The new man was there, but of course he knew nothing and had to be instructed. Of him I have much to say, for the whole history of trout in Northern India bears his mark. Sodhama, a poor little red-haired pundit with a weak body but a clear steadfast mind, then doing odd jobs for Narain Dass, the boat builder, who was incidentally also the landlord of the ground on which the Carpet Factory was built, undertook the work originally on a pay of Rs. 5 per mensem, on the assurance that it would lead to better things if all went well. He knew no English, though curiously he was well read in Sanskrit, to which Kashmiri is probably more closely allied

than any other living language. Consumption had also attacked one of his lungs, a complaint very common among carpet weavers and other indoor workers in Srinagar—not, one would say, a very hopeful man for the job, but it was not long before he justified his selection. Col. Godfrey has not mentioned among his good services, the purchase and despatch to Kashmir of a book written by an early American Trout breeder, called *Domesticated Trout*, a book of the greatest value to us at the time, as the instructions were clear and could be translated for Sodhama's benefit and never, I am sure, had the writer a more intelligent and patient student. From the time the ova arrived, trout culture became his life work ; but, though the healthy open air life cured his consumption, his remuneration in his native State has been a poor one. He wrote me the other day that he has nothing laid up for his old age. He is still only getting Rs. 30 \* a month from the State and has, I fear, no hope of a pension. If the many sportsmen who now enjoy trout fishing in Kashmir and the Punjab knew and appreciated all he has done for them, they might do something for him now.

He took down the first ova and plans for ponds to Kulu and planted the first boxes of ova in sites in the streams which were selected by Mr. Howell with his help and advice. For this he had the Punjab Government thanks and a presentation watch in addition to his liberal *Indian* pay. He has done similar work for Gilgit Kangra, Abbottabad, Kistwar, Chamba, Naini Tal, Shillong and Sikkim, not to speak of Simla where trout do not appear to have caught on. An exchange of rainbow ova was also successfully effected with Ootacamund by him. Clear headed and careful, he has always carried through successfully work entrusted to him. Kulu now rivals Kashmir as a fishing resort.

His care of the ova in the hatching box and of the fry when put out in the stew pond was untiring and the growth of the little fish was amazing. I measured one yearling, which with a few other very big ones was turned out in the Arrah river in October 1900, 10½" in length.

When transferred to the pond excavated near Panchgam in the Rukh area, the young fish continued to grow well under his care. They were hungry for flies when Sir Louis Dane who succeeded Col. Deane as Resident paid a visit to the pond. Sir Louis was much impressed by their condition and promptly went into the question of finance with the State Darbar, so that funds were shortly forthcoming to carry on the work (just in time as the Club funds were practically exhausted). He took a keen interest in the trout work and some years later when he became Lt.-Governor of the Punjab, he arranged for their introduction into the Kulu Valley where their success has been wonderful. At the exhibition he held in 1909 in Lahore, he had an exhibit of trout hatching carried out and with the help of Sir Shri Krishna Gupta, who was then

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\* Since writing this I have heard that, owing to the great advance in the price of rice in Kashmir, an allowance was made to all State servants drawing pay below a certain figure and that this has now been consolidated at 50 per cent. Sodhama's pay being now Rs. 45 per mensem.

working with the Secretary of State (Lord Morley), arranged for a travelling allowance to be given to Mr. Howell, who had been Assistant Commissioner in Kulu and had carried on the trout work there, to study fisheries in America during his leave. Departmental Fishery work was thus introduced into the Punjab and many fish have been saved from destruction during the contraction of rivers, whose water has been drawn off for the canals which in their turn have made millions of acres of desert into rich cultivated land.

*Financial arrangements.*—Col. Deane's view was accepted and supplemented by Sir Louis Dane when he had seen the ponds at Panchgaum (in the Rukh). A cheque for Rs. 2,000 was at once sent to me, and it was arranged that further sums required should be provided from the Game Preservation Department. As from the first, the accounts continued to be kept by a clerk in the Carpet office, who, as these became heavier, received a small monthly consideration for services so given. Accounts of all expenditure had to be rendered through the Game Preservation Department subject to audit by the State authorities. Estimates for the coming year also had to be prepared annually in time to be included in accounts presented to the State Council when the annual budget was under consideration with details of prospective expenditure under each head. This entailed a good deal of work for the clerk.

The great flood of July 1903 in Kashmir swept high over the pond at Panchgaum and nearly 1,000 trout which were expected to spawn that autumn lifted their noses into it with the joy of freedom, and with its subsidence settled down in the best pools of the Arrah River. No doubt some of them might have been netted out and spawned, in November, but as the floods had ideally cleaned the Redds, it was thought advisable to leave the fish alone and see how they would get on with their domestic arrangements under natural conditions—a new supply of ova being arranged for to start new ponds, with a view to spreading trout in other rivers of Kashmir, should success under natural conditions be proved. The result was satisfactory; for when the snow water had run off in the summer of 1904, little yearlings were found in gravels far below where the spawning had taken place, and some of these had passed through what was left of the burst reservoir, thus escaping the damage from native fish which had been freely prophesied for them.

By the request of the Durbar a new site *outside* the rukh had to be selected for ponds, and funds were provided to make them more suitable for the work than had earlier been possible.

The ponds were begun on the line of a small irrigation channel, a branch of one from the reservoir. Two small spring rivulets joined this and proved later of great value. Beginning with three ponds of 50' × 5' × 4'6" extensions down the channel were made as required; for the bigger fish, the width being doubled. The sides were of dry masonry faced with cement and the ends fitted with screens to prevent the trout escaping. Fry were a difficulty as they could escape through minute holes in the masonry and perforated zinc traps had to be arranged to catch those so getting through—an amazing number. Side channels to each pond made it possible to

clean them without stopping the whole flow. Possession of the channel was arranged with the villagers in the first instance without State assistance and after all had worked well for a year or two, everything was officially confirmed. A potter whose yard abutted on the area taken up, benefited, as visitors to see the trout were much interested in the working of his wheel and often bought some of the pretty though simple wares he produced.

#### ARTIFICIAL SPAWNING BEDS

Some 200 fish, reared from the 1902 importation of ova, had been kept in an artificial pond above flood level in the rukh. The water supply of this pond was from a fine spring which swarmed with gammeri, and it was chiefly on the crustaceans descending from this spring that they had existed. The flood had for a time upset all other arrangements for feeding them. They were a fairly level lot, the biggest not exceeding 6 oz. in weight. In their new quarters, below the rukh, to which they were removed in July 1904, they were fed on small fish brought from the Dal Lake, and so quickly did they grow on this diet, that by October 1906, when Lord Minto visited Harwan, it was possible to present him with a fish of 12½ lbs., the fish in the ponds being all at this time 6 lbs., and upwards in weight. An earlier viceregal visitor, Lord Amptill, when acting for Lord Curzon, had visited this new site shortly after this pond was made. Of the great house of Russell and kinsman of the Duke of Bedford, he naturally took an interest in the progress of the trout in Kashmir, but at the time of his visit the fish were small and few, and too many would have been required for a viceregal camp banquet. It was in this pond that the first attempt to obtain ova was made. As it was feared to damage fish by attempts to strip them by unpractised hands, an artificial spawning bed of rough gravel was arranged on rabbit wire, below which the ova coming through were trapped on perforated zinc trays. Rather over 2,000 ova were caught in this way. About 1,000 of these proving fertile were hatched out in the ordinary boxes and had reached the alevin stage and nearly to the fry stage when the lid of the box was one night left a little open and a water shrew got in. When morning came, he was found dead in the box with only one living fry as his companion. He had absorbed the 1,000 little fish and, so distended, could not get out and was drowned. The ova which arrived out that year was hatched in spring water in the open, protected by mats, as we had no hatchery till later.

From the very partial success of artificial spawning beds, it was evident that better methods must be taught and, when fishing with Capt. Allan for *Oreinus*, an idea struck me which I at once carried out. A bucket and a basin were soon brought and one or two cock-fish which were milting, were soon in the bucket. It was sometime however before a half-spent hen-fish was caught. I at once stripped her and fertilized the ova which I told Sodhama to place in the hatching box. He took away the basin with evidently the greatest doubt of any result and it was amusing to see the surprised expression on his face when some days later he came and told me

the ova had all hatched out. He very soon became expert and the work began in earnest the following autumn. Everything continued to be done in the open for two or three years, but, as more ova became available, a hatchery had to be built.

In 1905, when Mr. Pears was the Resident in Kashmir, he and Mrs. Pears came out one day and had lunch with me. Trout of 6" to 10" were getting plentiful in the smaller branches of the Arrah River and I asked him to catch one himself, but he was not very skilful with the rod. I caught 8 or 9 fish of 8" to 10" while they were with me on small barbless flies, and returned them to the water after showing them to my guests. A letter from Mrs. Pears a few days later was very amusing. She wrote saying she had been speaking to some one in Srinagar of what I had caught and his remark had been that 'Mitchell just catches the same fish over and over again to let you think there are a lot'. While showing the stream to the Pears, I saw a real big trout jump in the old Temple pool and thinking that with so many small ones in the water such a fish was not required, I later asked my brother Henry and some other friends (one of whom, now in London, will remember the occasion) to come out to lunch and see if we could catch it. My brother Henry who was very keen, was off with his rod directly we arrived at Harwan, and when, after a little delay, I arrived at the Temple pool as we called it, the fish, a cock of nearly 6 lbs. was gasping on the bank, having fallen a victim to a small fly spoon. We had him cooked at once and ate the most of him at lunch in the woods. The fame of this fish soon got abroad and a few permits were begged from the Maharajah resulting in some more captures, but it was not until the following year when I was in England and my brother Willie left in charge of the operations at Harwan that fishing began in earnest. When I returned shortly before Lord Minto's visit to Kashmir, general ideas about the success of the enterprise had completely changed, fish up to 9 lbs. having been captured in the Arrah River during my absence. From a financial point of view this made matters easier and simplified arrangements for the spread of trout to other rivers, but it created other difficulties I would gladly have avoided.

The question of a hatchery came on soon after and this was erected on a site no one wanted, just across the road from the ponds. The villagers took no interest in this little plot of land which looked like a bog, but was in point of fact a gravel bed, through which bubbled up the waters of a deep spring, issuing at a temperature of about 45° F. All the land about had been taken up for willow growing, or other village purposes and I had difficulty in getting a spot anywhere near to pitch a tent; so I thought I would put a wooden erection consisting of a couple of rooms and a bath room above this and did so. Kashmir workmen like to pick ova squatting, and the hatching boxes just raised above the floor suited them.

They work always in their bare feet and the spring water at 45° F. running freshly over this floor suited them very much better than dry cement concrete in hard frost. It also kept everything clean and sweet.

From the first the hatchery proved a success and the annual

distribution of ova soon ran into six and approached very nearly to seven figures. The water being fairly alkaline, we used perforated zinc trays instead of glass grills as in the hatching box originally sent out by the Duke of Bedford. Ova, when eyed, were distributed to many streams some of which might have done well had steps been taken early to protect them. The Game Preservation Department under Major Wigram rather specialized on the streams in the upper part of the Kashmir Valley with excellent results. Rearing ponds were established in the gardens at Achibal where unlimited spring water was available. Two lakhs of eyed ova went annually from Harwan to this centre from which yearlings and two-year old trout were easily distributed to the Vaishau and Bringhi and to the other waters of that part which were more especially reserved for State guests.

A demand for trout for State banquets and private dinner parties very early sprang up and this we met from the hatchery ponds at Harwan by selling off the bigger fish of 10 lbs. and over at Rs. 2 per lb. and smaller fish when available at Rs. 3 per lb. By doing so any accumulation of old unproductive fish was prevented and the cost of the work at Harwan was nearly covered annually by these sales and the sales of ova to clubs formed in India following the Kashmir success. It is possible that the price placed on trout at Harwan stimulated the Kashmir poacher in his efforts to meet a local demand at very much lower rates. The upper waters of the Liddar River responded nobly to early efforts to stock them with eyed ova in our 'pahari' ova boxes—now known in England as 'Kashmir boxes' and Col. Faithfull caught and returned to the water no less than 20 trout at Pahlgaum one day, fish up to 13" (about 1 lb. weight) being among the captures. This was the third year after ova had been laid down in these waters, but this success was quickly known and proved fatal. In the winter that followed, when the water was very low, poachers cleared the trout out and I did not attempt to re-stock. Hardly a year goes by without one or two trout falling to rods at Pahlgaum fishing with worm for so called 'snow trout' (*Diptycus maculatus*) but no basket of moment has ever since been made except probably by the poachers in winter. Pahlgaum is much too cold a place at that season for a prosperous game watcher to spend his winter. The lower waters of this river, when stocked and protected by the Game Preservation Department at Thicker, later became one of the best bits of reserved water in Kashmir.

I early turned my attention to the high lakes and with the sanction of Sir Amar Singh, the father of the present Maharajah, camped up through the Datchigam rukh to lakes Mahrsar and Tarsar. The beauty of this rukh (game reserve) consisting of forest grown as nature would have it, grassy slopes ever changing color with the seasonal wild flowers and grey crags stretching up into the snows is wonderful. The animal and bird life is such as one can find nowhere else. My favourite camp half way up was a spot of wild beauty where I could just find room for a little 80 lb. tent. Here I was wakened, the first time I camped there, with the notes of the most delicious Blackbird song I had heard in the East ringing in

my ears. I have many interesting recollections of deer, bears and other fauna of this rukh, but that is another story. I never fished lake Mahrsar, though the last time I was there in a dead calm, I saw a fine fish of about 3 lbs. swim away from the shore. Being in the rukh no one of whom I have heard has had a permit to fish this lake.

For various reasons I turned my attention to the high lakes round Harimukh which rises to over 18,000'. Lake Gungabal, the biggest of these, is about 2 miles long by  $\frac{1}{2}$  mile wide and lies 11,700' above the sea level. It is fed chiefly by glacier water and the flow from two or three small lakes 1,000' higher. The river from it, after passing over a series of perfect pools and gravels, falls rather sharply 500' into lake Nunkol, less than half the size of Gungabal from where, after a short run, it becomes torrential till it reaches the Sind River fully 5,000' lower down. These two high lakes are ideal for trout. The food supply, when trout were first put in, was wonderful, crustaceans especially being unusually plentiful. A red shrimp (about the size of Cyclops) was so numerous that one morning my servants were alarmed by what they thought was a patch of blood, quite a one-eighth of an acre in extent far out on the lake. In less than two hours this disappeared the shrimps going off in single file in every direction, in unbroken lines. Trying to fish in this mass of crustaceans from my collapsible boat in which I went out to examine it, I got touches such as wet fly-fishers must have experienced if they have used their favourite wet fly on a lake when the May fly (greendrake) is up. Small cockles also abounded as autopsies later showed and undescribed flies, including some of an *entirely new family*, showed everywhere. It was not till 1914 that I caught my first fish in Nunkol, a beauty of 3 lbs., and on my return to camp I found my mail with news of Germany's declaration of war on Russia. I sent half the fish to a Major of Gurkhas, who with his wife was camped on the other side of the lake, along with the news and we both started off down the hill as quickly as our transport could be got together. Untouched for some years the trout here multiplied rapidly and other lakes were gradually stocked from the shoals of small ones which soon appeared on the shallows. Lake Vishensar (12,500') was one of the first stocked in this way. It is the highest lake from which I ever caught trout. I believed at one time that the stock in these high lakes meant, as in Scotland, a permanent source of supply to the river proceeding from them, but I had reason to doubt this when last I visited Gungabal in 1925. The lake is believed to be sacred by the Hindu Pundits and a pilgrimage proceeds there annually in September. An official, who should have known better, took a party up to the lakes when the pilgrims were there and fished in the lake while the bathing was proceeding. The Pundits were furious. There was no protection and ruthless poaching with favourite poisons in the spawning season soon began. Where trout had swarmed in 1922, they were already scarce in the summer of 1925. The best fish I took out of these lakes was  $7\frac{1}{2}$  lbs. caught with a small fly such as I always use, but I have no doubt much bigger fish could have been got trolling.

Col. Dew (now Sir Armand) was much interested in the trout

work at Harwan and suggested finding money to cover the expense of sending ova and a skilled man to Gilgit, where he commanded and was satisfied there were suitable streams. The journey of 200 miles on a bridle path, crossing passes of 11,600' and 14,500' in mid-winter was an exceedingly difficult one and the first attempt failed, through the ova getting frozen. A later attempt was quite successful and the Harwan expert remained at Gilgit for some months till the fry stage had been reached. Col. Dew had then left, but the late Col. Macpherson, who succeeded him, was also keenly interested and the officers of the Agency have since had good sport with trout there.

After 1909, I was very little in Kashmir during the winter and Mr. Hugh Blunt who was with us in the Carpet Industry, took my place when I was away. He was very keen and made some useful additions and improvements at Harwan where Spring and Autumn of the years that followed were my chief times for visits.

The introduction of fauna into a foreign country must always be attended with risks of which it is easier to judge after the event; but looking back on 30 years I can see no serious harm directly attributable to the introduction of trout into Kashmir. That other fish are now scarce is more due to the great increase in the number of licensed fishermen who have gained by the rise in prices of fish. They made great scoops when the Woolar lake was lowered and they got access to the winter refuges of the native fish. The scarcity of these (especially the *Oreinus*) is now a loss to the country as they undoubtedly kept the rivers free of Algae growth and being spring spawners (when rivers are flooded by melting snow) if reasonably protected they were not so liable to almost total extinction as are trout by the barbarous poisoning methods which Indian poachers adopt when rivers are reduced by frost to mere trickles. Those who control the country will have to look at both sides of the picture in the future policy they have to pursue and I can only wish them every success.

#### NOTE ON NATIVE FISH OF KASHMIR.

The Kashmir fish referred to generally in Col. Godfrey's letter as 'hill barbels' are in the rivers.

1. The Cheroo—*Schizothorax esocinus*.
2. The Choosh—*Schizothorax intermedius*.
3. The Khont—*Oreinus sinuatas*.
4. The Snow Trout—*Dypticus maculatus*.
5. The Cat fish 'Anyur'—*Exostoma stoliczkae*.
6. The Horned loach—'Ramgrun' *Botia geto*.
7. The Loach 'Tilgrun'—*Nemachilus stoliczkae* or *marmorata*.
8. The Kashmir Grayling 'Ruppert' *Labeo dyochilus*.
9. The Mahseer—*Barbus tor*—migratory, coming up to spawn only.

A small lake fish *Cirrhina latia* which spawns on the weeds is also very plentiful and was much used for feeding trout.

Day described other species, but for practical purposes those I have enumerated above are all one comes in contact with.

They are all spring spawners and I regret to say that they were largely fished for in the past when they were spawning. The bigger fish then came up from the deep lakes and were easily caught. Cheroo hen-fish up to 20 or even 25 lbs., with ova actually running out of them when brought on board the fisherman's boat, were at times caught at Ganderbal where the Sind River leaves the hills—not unusually with what is known in Scotland as the 'London fly'. The cock-fish are always much smaller. These are caught often by fishers for Mahseer in autumn near the Woolar lake and then, when they are in condition, would give good sport on lighter tackle than that used for 40 lb. Mahseer. The Choosh don't run as big as the Cheroo and are by some anglers mistaken for the Khont which is much more of a river fish. This fish takes its name of 'Sinuatus' from its habit of twisting under water when sucking alga and moss off the stones with its thick sucking lips. Thousands of Khont when in their best condition in late autumn used to enter the big springs of the Arrah and Achabal Rivers and remain during winter in the underground streams—the source of these springs. They are, as far as I have seen, really useful in trout water, and it was much against my wish that efforts were made to exterminate them in such streams. A gentleman from New Zealand visited Kashmir in the early days and seeing the Oreinus lying in black masses at the bottom of some of the pools in the Arrah River, expressed disbelief in the success of trout there with such quantities of native fish. I laughed at him and told him I knew the relative powers of both fish and that I had no doubt on the subject. I have reason to think however that his expressed opinion added much to the disbelief in trout prospects which then existed in the country and did harm later in causing destruction of Oreinus I would have saved.

In some of my later reports I expressed myself strongly on the subject as the disappearance of *Sinuatus* synchronised with a great increase of alga and other deleterious matter as well as with a distinct decrease in the average size of trout. Like Mahseer these and the *Schizothorax* have their teeth in their throats.

The *Exostoma* are most interesting fish though very ugly. Poor swimmers, they yet are the only fish I have found who can make their way to the highest lakes by using their pectoral fins to climb over the stony sides of streams. They are fond of worms and can exist for many hours out of water. They are said to carry their young in their mouths and I once did find a very small living fish so placed.

The common loaches are very like those in English waters, but the Ramgrun is very different; a lake fish chiefly, he enters the streams to spawn and like the mango fish of Bengal is most appreciated when full of ova. The horn or spike by the gill is very sharp and should be avoided when holding the fish. *Labo dvocheilus* has scales like a grayling and is one of the best eating fishes of Kashmir and scarce in consequence. Like the others he is however very boney.